But in other cases a difficulty will arise. Where experience cannot speak with certainty, a scientific reason must be urged, and it will be necessary to formulate a series of deductions from the life-history of the insect or fungus which would justify a presumption that in different surroundings the pest might prove epidemic as well as destructive to plant life, or at least injurious to the crop. No doubt it will be possible, in the course of time, to declare with more accuracy than at present what are the circumstances in which such conditions might arise; but it will require a long and careful study, not only of plant hygiene, but also of the limits of the powers of adaptation to environment possessed by parasitic organisms, under the stimulus of altered climatic and cultural conditions, as well as freedom from injurious influences. This article in the proposed convention will, if adopted, have a marked influence on the trend of economic biology and plant pathology.

NOTES.

A collection of rock specimens of considerable historic interest has just been presented to the Department of Minerals of the Natural History Museum. The specimens in question were collected in Arctic North America by Sir John Richardson, who accompanied Sir John Franklin's Arctic Expeditions of 1819–1827. They have since that time been kept in the museum of the Royal Naval Hospital at Haslar, but inasmuch as the fossils collected in the same Arctic expeditions are in the National Museum at South Kensington, it was felt to be in the fitness of things that the rocks should be also preserved there. An application was accordingly made to the Lords of the Admiralty to sanction the transfer of the specimens from Haslar to Cromwell Road, with the result that, as we have stated, they are now in the Department of Minerals.

On Tuesday next, April 21, Dr. Walter Wahl will deliver the first of two lectures at the Royal Institution on problems of physical chemistry: (1) study of matter at high pressures, (2) study of matter at low temperatures; on Thursday, April 30, Dean Inge will begin a course of three lectures on the last chapter of Greek philosophy: Plotinus as philosopher, religious teacher, and mystic; and on Saturday, April 25, Dr. T. E. Stanton will commence a course of two lectures on similarity of motion in fluids: (1) the theory of similarity of motion in fluids and the experimental proof of its existence, (2) the general law of surface friction in fluid motion. The Friday evening discourse on April 24 will be delivered by Dr. F. W. Dyson, the Astronomer Royal, on the stars around the north pole.

Prof. E. Heyn, of Berlin, is this year to deliver the annual May lecture before the Institute of Metals, upon the subject of "Internal Strains in Cold Wrought Metals, and Some Troubles Caused Thereby." The last May lecture, by Sir J. Alfred Ewing, was on the subject of "The Inner Structure of Simple Metals," and previously Dr. G. T. Beilby had lectured on an allied subject, "The Hard and Soft States in Metals." Prof. Heyn's discourse will be given in the building of the Institution of Mechanical Engineers, Storey's Gate, Westminster, S.W., under the chairmanship of Admiral Sir Henry Oram, president of the Institute of Metals, on Tuesday, May 12, at 8.30 p.m. The secretary of the Institute, Mr. G. Shaw Scott, of Caxton House, Westminster, S.W., will be glad to forward tickets to any readers who may desire to be present at the lecture.

Prince Galitzin will preside over the fifth meeting of the International Seismological Association, to be held early next September, in St. Petersburg. The exact date of the meeting is not yet fixed, but the provisional programme has just been issued. Reports will be presented by the committees on microseisms, on tides in the earth's crust, the bibliography of seismology, the catalogues of earthquakes prepared by the permanent committee, and the uniformity in the arrangement of seismological bulletins. It will be proposed that a new station shall be founded at Bergen, that a reserve supply of seismographs should be kept for occasional or temporary use, and it will be urged that all seismographs should be provided with suitable "damping" arrangements, and that correct time should be supplied by telegraphic signals to all earthquake observatories. Among the papers promised may be mentioned those of the president on the analysis of seismograms, the comparative study of seismograms from different stations, and on observations of the angle of emergence, and of Prof. Omori on the tromometric observations made during the recent eruptions on the flanks of the Asama-yama.

News has just reached us of the death on February 18, in his forty-sixth year, of Dr. J. Huber, director of the Museu Goeldi, Pará, Brazil.

Mr. G. H. Martyn, writing from Biarritz, says that on March 30, at the end of a bright day with light winds, the sun appeared to pass through a clear sky and set in the sea, from which it seemed immediately to start rising again. "The reflecting layer of air was not wide enough to reflect the whole disc of the sun, but a band having a width of a third of the sun's diameter, so that the appearance was of the sun rising and passing behind a bank of invisible clouds."

In the *Irish Naturalist* for March Mr. N. Colgan contributes an article entitled "Field Notes on the Folk-lore of Irish Plants and Animals." He shows the current traditional knowledge of the transmogrification of species, and that of sexes in plants. Thus, the royal fern is believed to be the wild rannyock or common bracken, and the spargantium or bur-reed the wild shellistring or flagger. The people identify a he- and she-bulkishawn or ragweed, the latter turning out to be the common tansy. On the Irish coasts the common limpet or *patella* is firmly believed to develop out of the acorn-shell or *balanus* which covers the rocks. The grimmest belief about the elder is thus stated by a car-driver: "That's the elder tuff. It's a bad thing to give a man a scelp of that. If you do, his hand 'ill grow out of his grave."

A considerable portion of the second number of vol. v. of the Journal of the Federated Malay States

Museums is devoted to various groups of Malay aboriginal tribes, Mr. C. B. Kloss communicating a number of measurements and photographs of Biduanda (Mantra) of the Ulu Kenaboi, Jelebu, while Mr. J. H. Evans furnishes notes on the same tribe, as well as others relating to the natives of Lenggong, Upper Perak, and yet others on those of the Ulu Langat, Selangor. The Lenggong aborigines, although derived from a Negrito stock, speak a Sakai dialect, like the pure (Negrito) Semang of Grit, from which, however, they differ by their lighter colour. Like many of the other native tribes, they object, however, to be called either Semang or Sakai, the reason for this being that both these names are commonly used bv the Malays as terms of reproach. The people of the Ulu Langat and Ulu Kenaboi, who are all of one race, are more or less pure-bred Sakai.

IN the issue of *L'Anthropologie* for November-December, 1913, Mr. O. G. S. Crawford discusses the question of prehistoric trade between England and France. He directs attention to the discovery in southern England of certain stone celts, vases, and bronze palstaves of Continental types. These seem to have reached this country from the Cotentin peninsula, in which prehistoric remains, especially hoards, are abundant. In support of these views he further considers the position of sites in this country sacred to the worship of St. Catherine. These lie in the western half of our south coast, but are wanting in the eastern half. He suggests that her wheel is a symbol of light connected with a Gaulish divinity, known as Lhud in Britain, and Nuada in Ireland. The cult of St. Catherine, not known in England before the Norman Conquest, is believed to have arisen in sites sacred to her predecessor, the olden Gaulish deity.

AT a recent meeting of the Prehistoric Society of East Anglia, Mr. J. Reid Moir announced the discovery of a flint workshop floor in Ivry Street, St. Albans. An excavation for building purposes disclosed one foot of surface soil and two feet of fine stoneless sand. Then came the prehistoric stratum, containing flint cores and flakes, calcined flints, fragments of pottery, quartzite pebbles used as hammer-stones, and animal bones, some of which had been cut through, and, for some purpose, incised. Under this stratum lay fine sand to an unknown depth. Most of the flints were in the form of long flakes, patinated of a light blue colour. One had been trimmed for use as a scraper, and though it is difficult to attribute these specimens to any particular culture, Mr. Moir, judging from the length of the flakes, is inclined to assign them to the Magdalenian period. The bones found were those of a small sheep, teeth of an ox, and a tibia, probably that of a red deer. It is curious that another "find" of flints recently discovered at Ipswich is assigned to the Aurignacian period. If this attribution be accepted, we find remains of two Palæolithic periods within the confines of this town.

IN *Meddelelser fra Kommissionen for Havundersogelser, Fiskeri,* Bd. iv., we have two papers dealing with the biology of the plaice. The first of these is by Dr. A. C. Johansen, on the immigration of plaice to the coastal grounds and fiords on the west coast of Jutland, and contains some interesting data on the changes in frequency of young plaice from one year to another in the shore zone. The second paper is by B Saemundsson, on marking experiments carried out in the neighbourhood of Iceland. These experiments yield some results of interest, though they are not altogether satisfactory on account of the small numbers of fish dealt with. It is interesting to note that by far the largest number of recaptures were made by English trawlers from Grimsby and Hull. In the same volume there is a useful report by P. L. Kramp on fish-eggs and larvæ collected in 1909 in the Langelands Belt.

IN the March number of the *Journal of Economic Biology* (of which we notice that Mr. W. E. Collinge is now sole editor) Mr. A. A. Girault, of the University of Illinois, completes his "Preliminary Studies on the Biology of the Bed-bug (*Cimex lectularius*)," giving details of successive pairings and generations with statistics as to the periods of feeding and the numbers of eggs laid by the females under observation. In summarising the reactions of bed-bugs to various stimuli, Mr. Girault states that the insect's usual behaviour of shunning light may be abandoned under the stronger stimulus of hunger. "Bed-bugs will visit a host in daylight or in bright artificial lights when hungry . . . as soon as the food-stimulus is neutralised by engorgement, however, the negativeness to light becomes dominant again, and the insect runs off to hide itself."

THE February issue of the *Bulletin of Entomological Research* contains, as usual, systematic papers of considerable interest. Mr. F. V. Theobald writes on African Aphididæ, and is able to record "only thirty-five species for the whole African continent, about the number one can collect in a single afternoon in one's own garden in England," and several of these have clearly been introduced with nursery stock from Europe. Prof. R. Newstead describes new Coccidæ, and Mr. E. E. Austen new Tabanidæ, both papers being well illustrated. Of considerable interest is Mr. R. B. Woosnam's report on a search for Glossina (Tsetse-flies) on the Amala River in the southern Masai Reserve, of which he is game-warden. In a definitely restricted area along the river and its tributaries at more than 5000 ft. altitude he found a Western species, *G. fusca,* hitherto unknown in the East African Protectorate. The cattle, sheep, and goats of the Masai suffer very little from tsetse-borne disease, either because the people manage to avoid the fly-belt when moving their stock, or because only a very small proportion of the flies are infective.

BY publishing reports for two successive years in a single cover, the Felsted School Scientific Society is enabled to reproduce some of the prize photographs taken by its members, the report for 1912–13 consequently presenting a more than usually attractive appearance. Particular interest attaches to the photographs of a young cuckoo and its foster-parent, a whitethroat.

In the newly issued vol. xxxiv. of "Botanisk Tidsskrift," Copenhagen, Ø. Winge gives an account of some new Sagasso Sea investigations. During 1911–13, the Danish Commission for the Study of the Sea organised a collection of plankton samples by Danish Transatlantic vessels. This material is now to be worked up, and Winge, who is studying the distribution and frequency of the Sargasso, finds the Gulf-weed consists chiefly of two species (*S. bacciferum* and *S. vulgare*), besides other less common forms (*Sargassum* species and *Ascophyllum nodosum*). The great quantity of Sargasso was met with between lat. 37° and 23° N., and long. 35° to 60° W., within an oval area about 600 miles broad. As was the case with the earlier "Sargasso-frequencies" of Krümmel and Antze, all the samples show an autumnal simultaneous increase of the quantity of the Sargasso. This suggests that the floating Gulf-weed has a long-lasting drift and a yearly growth-period in the late summer. Sexual reproduction of the drifting Sargasso is still unknown.

P. D. Quensel adds very greatly to our knowledge of the geology of western Patagonia in his "Geologisch-petrographische Studien in der patagonischen Cordillera" (Bull. Geol. Inst. Univ. of Upsala, vol. xi., p. 1). The great group of laccolitic intrusions, varying from granite to gabbro, is younger than the Cretaceous period, and even cuts the folded structure of the chain. As the photographs of scenery show, frost-action produces superb crags and pinnacles in these young and well-jointed granitoid rocks.

British geologists may be both surprised and gratified to find an elaborate paper in English on the geological structure and history of the Falkland Islands, by Thore G. Halle, in the Bulletin of the Geological Institution of the University of Upsala (vol. xi., pp. 115–226), accompanied by numerous illustrations and a coloured map. The feature of cardinal importance is the discovery of Permo-Carboniferous strata, with Glossopteris, and a glacial boulder-bed ("tillite") at the base. For this series the author proposes the local name Lafonian. The Permo-Carboniferous glaciation is thus seen to have a very wide extension, and it is interestingly pointed out that a laminated clay, and the occurrence of annual rings in the Dadoxyla of the local Gondwana flora, indicate a solar control of the climate during cold conditions. The laminated clay is figured, and bears a remarkable resemblance to those associated with the pre-Cambrian glacial beds in Ontario and with post-Pliocene glacial beds in Sweden.

A full report of the recent Sakura-jima eruption has been issued in Japanese by the Kagoshima Meteorological Station; it is especially interesting as giving accurate records of the events which preceded and followed the great eruption. The actual eruption commenced on the morning of January 12, but earthquakes, gradually increasing in intensity and frequency, were felt from early morning on January 11. The general features of the eruption have been already described, but we have now further particulars concerning the lava-flow. On January 14, at 7 a.m., a lava-stream was seen issuing from the mountain, but, encountering high ground, it spread out to a width of a mile and a half, with a thickness of "some scores of feet"; the flow of lava was resumed on the following day, several small craters being opened along its course, and on January 16 the lava-current reached the sea, pushing its way out to one of the small islands in the bay. The activity of the volcano gradually diminished from this time, but did not entirely cease until January 27. The earthquake shocks, which became less violent during the eruption, increased in number and intensity as the volcanic action declined, and then gradually died away. The seismometer recorded no fewer than 418 shocks on the day before the eruption, but during the eruption the seismometer having been broken, it was difficult to distinguish between earth-vibrations and the volcanic rumblings.

The Royal Meteorological Institute of the Netherlands has published the third quarter (December-February) of a new edition of its very laborious work, "Oceanographic and Meteorological Observations in the Indian Ocean." It consists of two parts: (1) tabular results for the years 1856–1910, and (2) charts constructed therefrom. This issue is much more complete than that for the previous quarter, owing to the inclusion (1) of observations for a longer period, and (2) of a large amount of data received from other meteorological services. In this latter respect special thanks are accorded to our own Meteorological Office. These additions, referring partly to routes not usually taken by Dutch vessels, have allowed certain areas to be more fully represented. The charts, twenty-five in number, show the frequency of direction and mean velocity of currents and winds, together with the general circulation of air and water for each of the months in question, isobars, isotherms, etc. On the backs of some of the charts details likely to be of use to seamen, and based upon all available data, have been carefully prepared. Taking into account the possible establishment of a direct service between the Netherlands' East Indies and South Africa routes are laid down for vessels between those parts, in addition to the tracks recommended for other places on either side of the Indian Ocean.

The shape of a nearly spherical drop falling in a viscous liquid of different density forms the subject of a paper by Shizumi Saito in the Science Reports of the Tokyo Imperial University, vol. ii., No. 5. The solution is obtained by harmonic analysis, though the method could be shortened by employing the ordinary polar equations of motion or Stokes's stream function. The paper leads to the conclusion that the drop may be deformed into a prolate or oblate spheroid, the distinguishing criterion being in the form of a relation connecting the densities and viscosities of the inner and outer liquids.

A valuable report on the effect of ice on the flow of streams in the United States has been drawn up by Mr. W. G. Hoyt, and forms Water Supply Paper 337 of the U.S. Geological Survey. The first report on the subject was issued in 1907, and dealt mainly with the field operations necessary for the estimation of the rate of flow. The present paper goes much further, owing to the work which has been done in the interval, and includes a discussion of the factors which influence the flow during the low-temperature period, and the calculation of the flow from the observations taken.

THE Journal of the Washington Academy of Sciences for March 19 contains a *résumé* of a paper on the brightness of optical images by Mr. P. G. Nutting, which is to be published *in extenso* elsewhere. The results obtained deal principally with the transmitting power of various types of photographic lenses. The method adopted consists in exposing a white magnesia block to a luminous source of 1500 candle-power enclosed in opal glass, and comparing the brightness of the magnesia when illuminated direct, with the brightness of the image of the source when thrown on the same surface by the lens system under test. The observed transmissions vary from 57 per cent. for a Zeiss-Krauss tessar to 92 per cent. for a Fuess telescope objective. For several process lenses the transmission is 76–78 per cent., showing that for the six glass-air surfaces of which they consist the transmission is quite up to that theoretically obtainable.

IT is interesting to read in the *Revue Générale des Sciences* (March 15) an elementary discussion of the principle of relativity by Prof. H. A. Lorentz, to whom, more than to any other, the hypothesis owes its origin. After a very clear exposition of some simple ideal experiments which illustrate the relative nature of the measures of space and time, he dismisses in a single paragraph what is to most physicists the greatest objection to the principle, the apparent denial of the existence of the æther as they had come to think of it. "That is, as it seems to me, a question towards which each physicist may take the attitude which best agrees with the way of thinking to which he is best accustomed." ". . . he must recognise that it is impossible for him to know the direction and the velocity of the æther (relative to his apparatus), and, if he feels the need of not concerning himself with his ignorance, he will take the side of M. Einstein." It is interesting to speculate how far it is possible to use these words and at the same time to feel convinced of the objective existence of a unique æther, which is something more than a convenient way of correlating phenomena, but may be described in Prof. Lorentz's own words as "always remaining at rest," and "endowed with a certain degree of substantiality."

IN the *Monist* (vol. xxiv., No 1) Mr. Leonard T. Troland, under the title "The Chemical Origin and Regulation of Life," combats recent views on vitalism, that "cult of incompetence" in biology. The position taken up is that "a single physico-chemical conception may be employed in the rational explanation of the very life phenomena which the neo-vitalists regard as inexplicable on any but mystical grounds. This conception is that of the enzyme or organic catalyst." The thesis is developed along five distinct lines, the author maintaining that this conception will ultimately prove adequate to resolve such fundamental mysteries as the origin of living matter, the origin of organic variation, the problems of heredity, the mechanism of individual development, and the nature of physiological regulation in the mature organism.

AN important method for the rapid estimation of zinc in coinage bronze and similar alloys is described by Dr. T. K. Rose, Assayer to the Mint, in a paper read before the Society of Chemical Industry (vol. xxxiii., No. 4). In this method the zinc is volatilised away by heating one gram of the alloy in a carbon crucible for two hours at a temperature of about 1375° C. Strictly speaking, this is not an entirely new method in principle, having been described many years back, but it is a process that has never come into general use. Dr. Rose has now made the method a perfectly practical one by accurately defining the conditions which are necessary for success. The main advantage of the method lies in the great saving of time and the avoidance of troublesome chemical manipulations.

THE use of catalysis in organic syntheses has come into increasing use in recent years. In the current number of the *Comptes rendus* (No. 14, April 6) additional details are given by MM. Paul Sabatier and A. Mailhe on the advantages of manganous oxide as a catalytic agent in the synthesis of aldehydes and ketones. A fatty acid mixed with an excess of formic acid passed over a column of manganous oxide at a temperature of 300° C. to 360° C. gives the aldehyde corresponding to the acid, the yields being from 50–70 per cent. of the theoretical. The authors describe the preparation by this method of six aldehydes. With the same reagent adipic acid gives *cyclo*pentanone in 80 per cent. yield, and β-methyladipic acid gives β-methyl*cyclo*pentanone. Manganous oxide is cheap, and preserves its catalytic properties over a long period.

OIL-SEEDS, oils, fats, and waxes are the subjects dealt with in a recently issued collection of "Selected Reports" from the Scientific and Technical Department of the Imperial Institute (No. 88, Colonial Reports—Miscellaneous, Cd. 7260). The publication includes all the more important reports on the above-mentioned products made to the Colonial, Indian, and other Governments during the years 1903 to 1912. A large number of seeds and oils have been analysed and otherwise tested by the department, the object in view being to give information as to the yield and nature of the oil obtainable from the seeds, and the possibility of utilising the products commercially. The reports proper are preceded by a short introduction explaining the classification of the oils into groups, and the meaning of the analytical terms employed in the descriptions. Among the more interesting memoirs is one on the utilisation of para rubber seed, which contains a drying oil possessing properties very similar to those of linseed oil; it is concluded that the kernel is a valuable economic product. One of the longest reports treats of the palm-oil industry in British West Africa. Large areas of oil-palm forest still exist almost untouched, and though the native processes for extracting the oil are crude and wasteful, it is considered that no failure of supply is likely to occur in the immediate future.

The April issue of Mr. C. Baker's list of "Second-hand Instruments for Sale or Hire" is now available, and can be obtained post free on application to 244 High Holborn, London. The catalogue contains descriptions of nearly 2000 pieces of scientific apparatus, amongst which modern microscopes and objectives, telescopes and spectroscopes, take a prominent place. The preface to the catalogue points out that every instrument is guaranteed to be in adjustment, and that customers may in certain circumstances have instruments for three days on approval.

Messrs. Dulau and Co., Ltd., 37 Soho Square, London, W., have just issued their Catalogue 65 dealing with works on recent and fossil ichthyology which they are offering for sale. The list contains 1740 entries, and includes periodicals as well as books on every branch of the science concerned.

OUR ASTRONOMICAL COLUMN.

April Shooting Stars.—Mr. W. F. Denning writes:—On Tuesday night, April 21, there may occur a rich return of the April meteoric shower. It is uncertain, however, what this year's aspect of the display will be, as the periodic time is not known. There were brilliant returns in 1803 and 1851, and there is indication that the brighter and more abundant exhibitions of this stream occur at intervals of sixteen years. If so, it ought to be well seen in 1915, but in view of the doubts remaining, the phenomenon should be watched every year, for negative evidence is sometimes useful. The Lyrids probably form a moving radiant like the Perseids, the motion being to the eastward one degree a day. This feature should be attentively looked for, but the shower is usually a very brief one, and meteors directed from it are rarely seen before April 19 or after April 22. This year the moonlight will be almost absent from the sky at the time of the maximum, so that with a clear atmosphere the circumstances will be highly favourable for its observation.

Nova Geminorum No. 2.—A number of observations has recently come to enrich the general store of data regarding this nova, and some of these later contributions possess a high degree of importance. This applies especially to a memoir appearing in Bulletin No. 3 of the Imperial Academy of Sciences, St. Petersburg, communicated by M. N. V. Vojtkevič-Poliakova, of the Pulkova Observatory. Unfortunately for English students this memoir is printed in Russian, but it contains an excellent plate giving reproductions of eight spectrograms of the new star. It is at once apparent that evidence has been obtained regarding the transient proemial phase during which the nova exhibited a dark-line spectrum showing characteristics resembling that of Procyon. Although the Harvard spectrograms had established beyond any possibility of doubt that this nova had indeed passed through this so much questioned stage, the value of independent confirmatory evidence need not be insisted on. The series of thirty-six spectrograms discussed in the paper extends from March 15, 1912, to October 8, 1913, and includes two excellent plates taken on the first date, and others for March 16, 17, and 18. The wholly dark-line stage so happily caught at the Harvard College Observatory was missed at Pulkova, but the leading Procyonian features are still predominant in the first two spectra, although the bright-line spectrum is making its appearance, and on March 16 predominates, but the H and K lines may still be seen quite plainly.

Another spectroscopic paper comes from the Catania Observatory, and is the work of Dr. Vittorio Fontana. It appeared in the Memoirs of the Società Spettroscopisti Italiani, vol. ii., series 2, pp. 201–10.

Additional observations of the light changes of this nova are given in two papers published in No. 4720, *Astronomische Nachrichten*. In the first of these von J. Kasansky, Moscow Observatory, presents fifty-seven determinations, ranging from the time of the discovery (March 14, 1912) to March 27, 1913. The observed magnitudes range from 3·58 (H.R.) on the former to 8·76 on the latter date. By March 16 the brightness of the nova had fallen nearly two magnitudes to 5·54. The magnitudes for the greater part of the series are also stated in terms of the Potsdam scale, and can thus be at once compared with the values given in the other paper, which is by Sig. Eugeni Guerrieri, Capodimento Observatory. This series includes 139 determinations of magnitude between March 28, 1912, and April 29, 1913. The light curve exhibits the typical characteristics of nova variability. For the few common dates the two series show good agreement.

Diurnal Variations of Latitude.—During last year M. Jean Boccardi, in discussing the results of his observations for latitude made by the method of Struve, drew the conclusion that an effect of lunar attraction was suggested by displacements from the vertical. As these displacements were considerably greater than those which he could calculate by theory he was led to conclude that these latitude variations were caused by geological conditions special to the place of observation. Having subsequently become acquainted with M. Schumann's researches on latitude variations in which he could trace undulatory curves showing diurnal variations of latitude, M. Boccardi has completed some diagrams showing the march of the latitude values. These diagrams are not published in the communication which he sends to the *Comptes rendus* of the Paris Academy of Sciences (February 9, 1914, No. 6); tables only are given, but he states that the maxima and minima values of the latitude obtained with the four stars which he has observed follow one another at intervals which correspond to the movement made by the moon in right ascension during the corresponding intervals of right ascensions between the stars. Thus the action of the moon seems to be demonstrated.

A Perpetual Calendar.—We have received a neat perpetual calendar, "Alle Jahreskalender auf einem Blatt," by "Dr. Doliarius," of Leipzig (B. G. Teubner). It is of postcard size, and seems well adapted to the requirements of clergymen and others. Three tables are given: (1) the dates of Easter according to the Gregorian calendar, 1582–2000; (2) the corresponding Julian dates, 1470–2004; and (3) a double enumeration of the days of the year arranged in thirteen columns in such a way that any seven consecutive columns are complete in themselves. A separate card frame is supplied having a slit which fits over the width of seven columns, and as the top of the slit is marked with the seven days of the week an annual calendar is displayed when the frame is placed over table (3). The correct position of the frame is determined by a marked space which is adjusted to the date of Easter for the year required according to the indication of table (1) or (2). The manipulation of the calendar is quite simple, and furnishes the dates of the principal church festivals very readily.